

Source Collector Module Prototype

Complete stand-alone unit

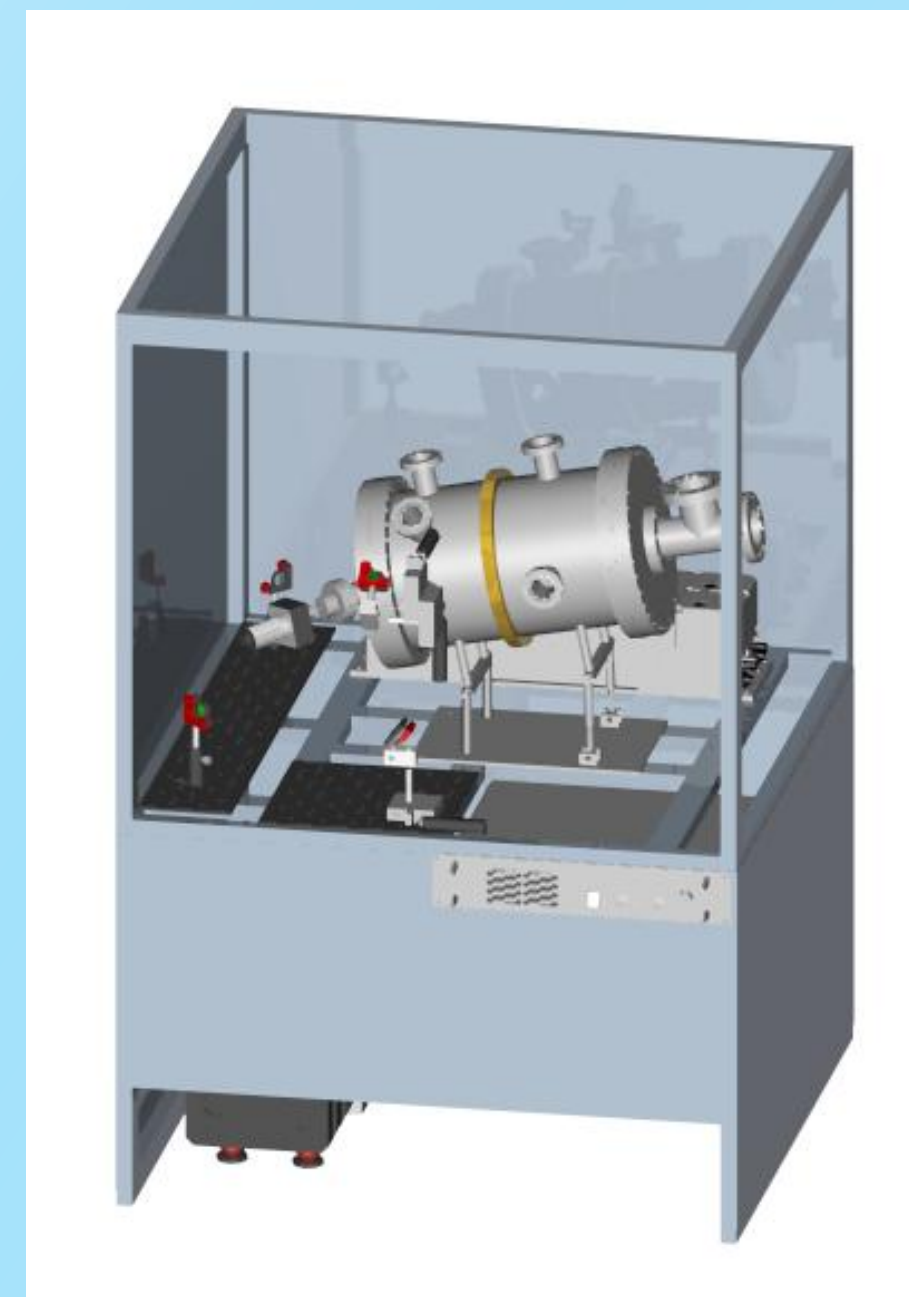
Small footprint (1m X 1m)

Integrated source & collector

Plasma fuel and the collector coatings are the same material

Laser: Edgewave IS Series

- Nd:YAG 10 ns, 25 mJ, 4 kHz, 100 W



Future Development

Move to higher average power Edgewave laser.

- Nd:YAG 10 ns, 25 mJ, 16 kHz, 400 W

Fab Qualification.

Full power lifetime measurements.

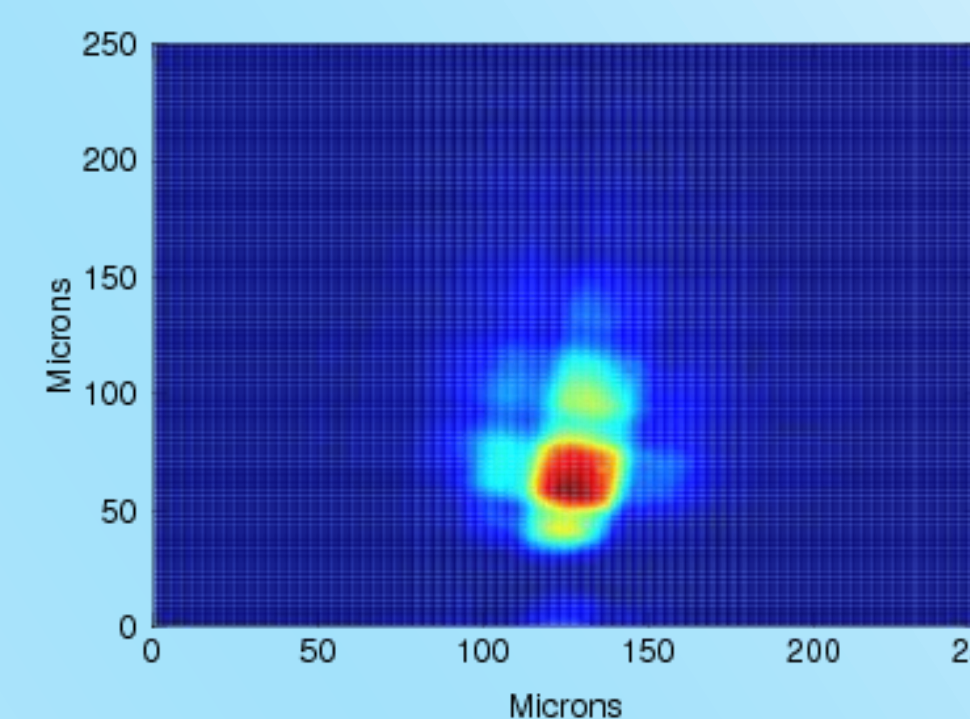
Key Milestones

Working Demo tool, Nov 2011.

First product, mid 2012.

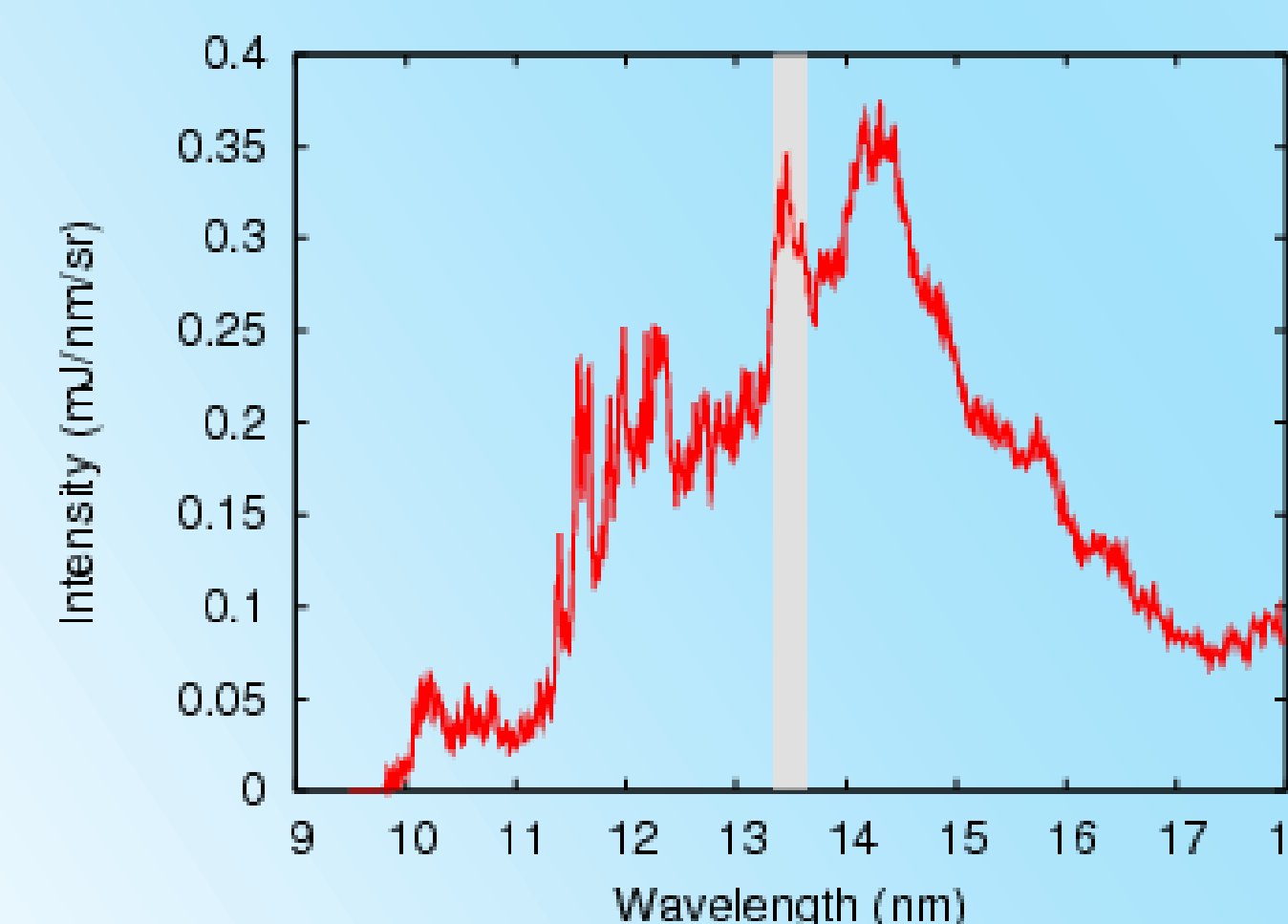
The Source Source Imaging

- Imaged at 13.5 nm with concave multilayer mirror
- Plasma diameters measured as low as 35 μm



EUV Characterisation

- EUV spectra, absolutely calibrated spectrometer.
- CE of 1.25% observed

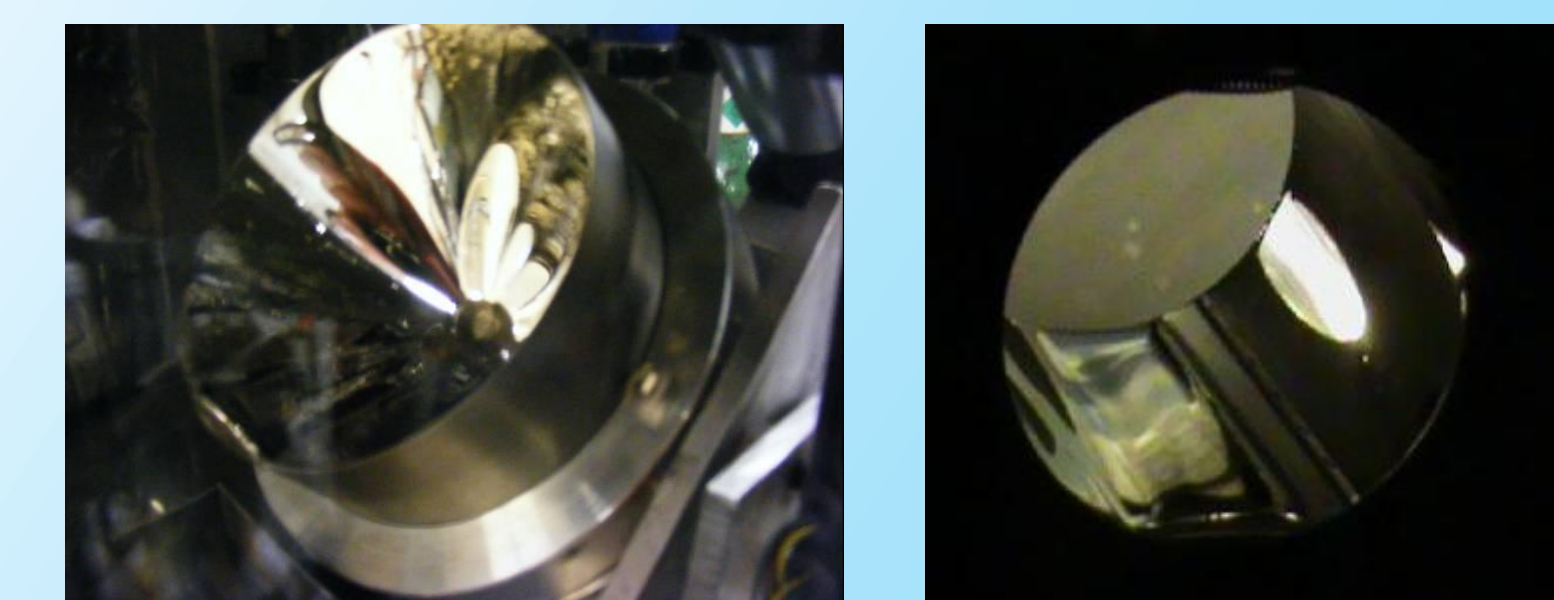


Future Work

- Optimise CE and plasma size trade-off.

The Mirror Liquid Coating

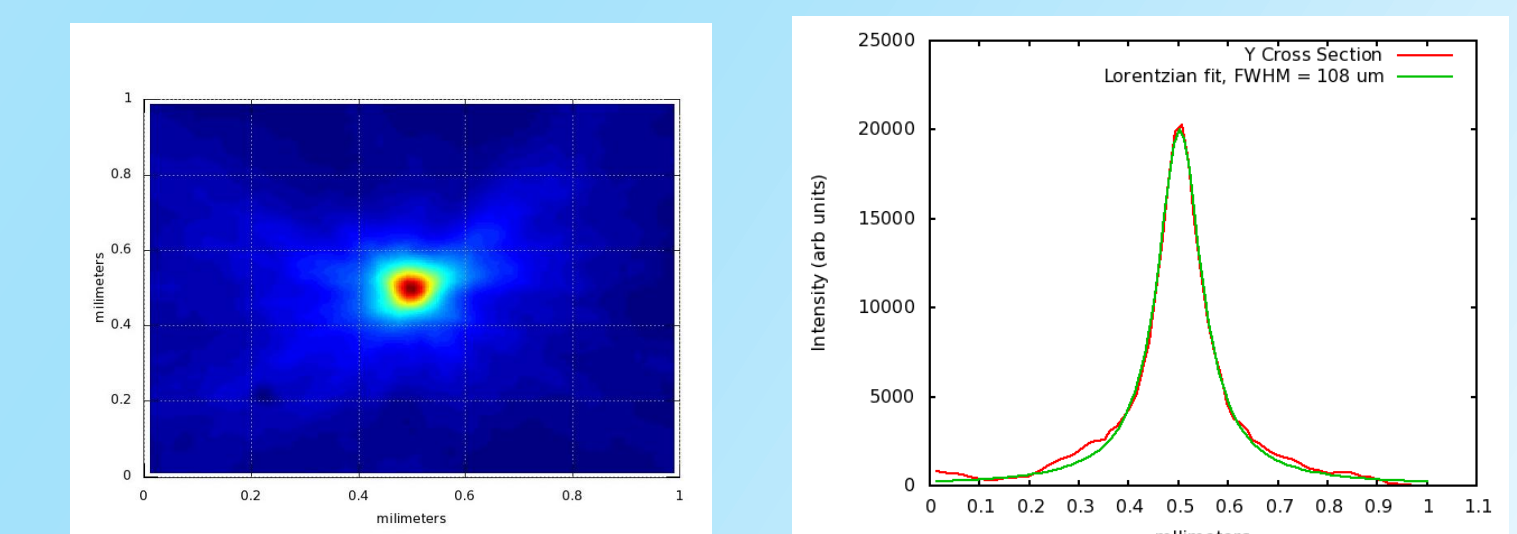
- Tin-based alloy (GaInSn)
- Liquid at room temperature



Focused EUV Images

In-house LPP source

- 50 mJ/pulse
- 50 Hz
- Nd:YAG



Lifetime

- Demonstrated stability:
- LPP: 1.25 W, 5M shots
- Bruker DPP Source: 200W, 20M shots
- Collector re-usable after many venting cycles
- Future testing with LPP, 4 kHz, 100 W

Conclusion: We are developing a complete source collector module for EUV metrology. Our patented technology allows the complete integration of the collector with the source without the need for any intermediate debris mitigation. Our LPP source uses the same liquid metal for target as for the collector coating.

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